CLAIMS

1. A method for detecting myocardial ischemia, the method comprising:

obtaining a first signal indicative of dynamic mechanical activity of a heart;

obtaining a second signal indicative of electrical activity of the heart; and

detecting myocardial ischemia based on both the first signal and the second signal.

2. The method of claim 1, further comprising detecting myocardial ischemia when the first signal and the second signal both satisfy criteria for indication of ischemia.

3. The method of claim 2, wherein the criteria include a change in the first signal having a first predetermined relationship to a first threshold and a change in the second signal having second predetermined relationship to a second threshold.

4. The method of claim 3, wherein the first predetermined relationship is a decrease in the first signal that drops below the first threshold, and the second predetermined relationship is an increase in the second signal that exceeds the second threshold.

5. The method of claim 1, further comprising, when myocardial ischemia is detected, generating a signal for delivery of therapy to alleviate effects of the ischemia within the heart.

6. The method of claim 1, further comprising, when myocardial ischemia is detected, storing information about the myocardial ischemia for review by a physician.

7. The method of claim 1, further comprising, when myocardial ischemia is detected, notifying the patient.

8. The method of claim 1, further comprising, when myocardial ischemia is detected, delivering therapy to alleviate effects of the ischemia within the heart.

9. The method of claim 1, further comprising, when myocardial ischemia is detected, delivering therapy to a patient including at least one of drug delivery, electrical stimulation, modification of ongoing electrical stimulation, and a combination of drug delivery and electrical stimulation.

10. The method of claim 1, wherein obtaining the first signal includes obtaining a heart acceleration signal from an accelerometer deployed within the heart.

11. The method of claim 1, wherein obtaining the first signal includes obtaining a heart acceleration signal from an accelerometer integrated in a tip of an implanted lead deployed in the heart.

12. The method of claim 11, wherein the lead is a therapeutic lead coupled to an implanted medical device for delivery of electrical stimulation to the patient.

13. The method of claim 11, wherein the lead is a diagnostic lead coupled to an implanted medical device for acquisition of diagnostic data.

14. The method of claim 1, wherein obtaining the first signal includes obtaining a pressure signal from a pressure transducer deployed within the heart.

15. The method of claim 1, further comprising obtaining the second signal from a set of internal leads implanted in the heart.

16. The method of claim 1, further comprising obtaining the second signal from a subcutaneous electrode array.

17. The method of claim 1, further comprising obtaining the second signal from a set of external leads in contact with the body surface of a patient.

18. The method of claim 1, further comprising:

comparing a change in a first parameter associated with the first signal to a first threshold;

comparing a change in a second parameter associated with the second signal to a second threshold; and

indicating myocardial ischemia when the change in the first parameter exceeds the first threshold and the change in the second parameter exceeds the second threshold.

19. The method of claim 18, wherein the first signal parameter represents

an amplitude of the first signal.

20. The method of claim 18, wherein the first signal parameter represents an integral of the first signal during a period of time proximate to the R-wave.

21. The method of claim 18, wherein the second signal is one of an electrocardiogram and an electrogram, and the second signal parameter is an amplitude of an ST segment of the electrical signal measured relative to the isoelectric level of the electrical signal.

22. The method of claim 21, further comprising indicating myocardial ischemia when the first signal parameter varies from a first level by a first amount and the second signal parameter varies from a second level by a second amount.

23. The method of claim 1, further comprising:

generating a parameter based on both the first signal and the second signal; and

detecting myocardial ischemia based on comparison of the parameter to a threshold.

24. The method of claim 1, further comprising quantifying a degree of ischemia based on the first signal and the second signal.

25. The method of claim 1, further comprising determining a location of ischemic tissue based on the first signal and the second signal.

26. The method of claim 1, wherein the first signal includes a plurality of first signals, each of the first signals indicating dynamic mechanical activity of the heart along one of a plurality of axes, the method further comprising determining a location of ischemic tissue based on the plurality of first signals.

27. The method of claim 26, wherein the second signal includes a plurality of second signals, each of the second signals indicating electrical activity of the heart along one of a plurality of axes, the method further comprising determining a location of ischemic tissue based on the plurality of first signals and the plurality of second signals.

28. A system for detecting myocardial ischemia, the system comprising:

a first sensor that generates a first signal indicative of dynamic mechanical activity of a heart;

a second sensor that obtains a second signal indicative of electrical activity of the heart; and

a processor that detects myocardial ischemia based on both the first signal and the second signal.

29. The system of claim 28, wherein the processor detects myocardial ischemia when the first signal and the second signal both satisfy criteria for indication of ischemia.

30. The system of claim 28, wherein the criteria include a change in the first signal having a first predetermined relationship to a first threshold and a change in the second signal having second predetermined relationship to a second threshold.

31. The system of claim 30, wherein the first predetermined relationship is a decrease in the first signal that drops below the first threshold, and the second predetermined relationship is an increase in the second signal that exceeds the second threshold.

32. The system of claim 28, wherein the processor generates, when myocardial ischemia is detected, a signal for delivery of therapy to alleviate effects of the ischemia within the heart.

33. The system of claim 28, wherein the processor, when myocardial ischemia is detected, stores information about the myocardial ischemia for review by a physician.

34. The system of claim 28, wherein the processor, when myocardial ischemia is detected, notifies the patient.

35. The system of claim 28, wherein the processor, when myocardial ischemia is detected, controls delivery of therapy to alleviate effects of the ischemia within the heart.

36. The system of claim 35, wherein the therapy includes at least one of drug delivery, electrical stimulation, and a combination of drug delivery and electrical stimulation.

37. The system of claim 28, wherein the first sensor includes an accelerometer integrated with an implantable lead.

38. The system of claim 28, wherein the lead is a therapeutic lead coupled to an implantable medical device for delivery of electrical stimulation to the heart.

39. The system of claim 38, wherein the lead is a diagnostic lead coupled to an implantable medical device for acquisition of diagnostic data.

40. The system of claim 28, wherein the first sensor includes a pressure transducer integrated within an implantable lead.

41. The system of claim 28, wherein the second sensor includes electrodes arranged for acquisition of an ECG, EGM, or SEA signal.

42. The system of claim 41, wherein at least some of the electrodes are carried by implantable leads.

43. The system of claim 41, wherein the electrodes are configured for external use relative to a surface of a human body.

44. The system of claim 28, wherein the processor is programmed to compare a change in a first parameter associated with the first signal to a first threshold, compare a change in a second parameter associated with the second signal to a second threshold, and indicate a myocardial ischemia when the change in the first parameter exceeds the first threshold and the change in the second parameter exceeds the second threshold.

45. The system of claim 44, wherein the first parameter represents an amplitude of the first signal.

46. The system of claim 44, wherein the first signal parameter represents an integral of the first signal during a period of time proximate to the R-wave.

47. The system of claim 44, wherein the second signal is one of an electrocardiogram and an electrogram, and the second signal parameter is an amplitude of an ST segment of the electrical signal.

48. The system of claim 47, wherein the processor indicates myocardial ischemia when the first signal parameter varies from a first level by a first amount and the second signal parameter varies from a second level by a second amount.

49. The system of claim 28, wherein the processor generates a parameter based on both the first signal and the second signal, and detects myocardial ischemia based on comparison of the parameter to a threshold.

50. The system of claim 28, wherein the processor quantifies a degree of ischemia based on the first signal and the second signal.

51. The system of claim 28, wherein the processor determines a location of ischemic tissue based on the first signal and the second signal.

52. The system of claim 28, wherein the first signal includes a plurality of first signals, each of the first signals indicating dynamic mechanical activity of the heart along one of a plurality of axes, and the processor determines a location of ischemic tissue based on the plurality of first signals.

53. The system of claim 52, wherein the second signal includes a plurality of second signals, each of the second signals indicating electrical activity of the heart along one of a plurality of axes, and the processor determines a location of ischemic tissue based on the plurality of first signals and the plurality of second signals.

54. The system of claim 28, further comprising a telemetry device for wireless transmission of a message upon detection of ischemia.

55. The system of claim 28, wherein the first sensor includes a multi-axis accelerometer and the first signal includes a plurality of heart acceleration signals, each of the heart acceleration signals indicating contractile acceleration along one of a plurality of axes, the processor determining a location of ischemic tissue based on the heart acceleration signals.

56. A method for detecting myocardial ischemia, the method comprising:

obtaining a first signal indicative of contractile activity of a heart;

obtaining a second signal indicative of electrical activity of the heart; and

detecting myocardial ischemia based on both the first signal and the second signal.

57. The method of claim 56, further comprising, when myocardial ischemia is indicated, delivering therapy to alleviate effects of the ischemia within the heart.

58. The method of claim 56, wherein the therapy includes at least one of electrical stimulation and drug delivery.

59. The method of claim 56, wherein obtaining the first signal includes obtaining a heart acceleration signal from an implanted accelerometer.

60. The method of claim 59, further comprising obtaining the accelerometer signal from an accelerometer mounted in a tip of a lead implanted in the heart.

61. A system for detecting myocardial ischemia, the system comprising:

means for generating a first signal indicative of contractile activity of a heart;

means for obtaining a second signal indicative of electrical activity of the heart; and

means for detecting myocardial ischemia based on both the first signal and the second signal.

62. The system of claim 61, further comprising means for controlling, when myocardial ischemia is indicated, delivery of therapy to alleviate effects of the ischemia within the heart.

63. The system of claim 61, wherein the therapy includes at least one of drug delivery, electrical stimulation, and a combination of drug delivery and electrical stimulation.

64. The system of claim 61, wherein the means for generating the first signal includes an implanted accelerometer and the first signal is a heart acceleration signal.

65. The system of claim 64, wherein the accelerometer mounted in a tip of a lead implantable in the heart.

66. A computer-readable medium containing instructions for causing a processor to:

obtain a first signal indicative of dynamic mechanical activity of a heart;

obtain a second signal indicative of electrical activity of the heart; and

detect myocardial ischemia based on both the first signal and the second signal.

67. A computer-readable medium containing instructions for causing a processor to:

obtain a first signal indicative of contractile activity of a heart;

obtain a second signal indicative of electrical activity of the heart; and

detect myocardial ischemia based on both the first signal and the second signal.